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From the Society for Developmental Biology

Brigid Hogan awarded developmental biology—SDB lifetime achievement award

Hogan (left) receiving Lifetime Achievement Award from SDB President (2014-2015), Lee Niswander at 74th SDB Annual Meeting in Snowbird, Utah.

The 2015 Developmental Biology—Society for Developmental Biology lifetime achievement award was presented to Brigid Hogan of Duke University School of Medicine for her outstanding and sustained research and mentoring contributions to the field of developmental biology. Hogan pioneered the molecular analysis of early mammalian development. She developed tools where there were none—that is constructed cDNA libraries from early mouse embryos and developed molecular probes that enabled her group to isolate some of the first mammalian Hox genes. Hogan's extensive research on bone morphogenetic proteins (BMPs) established its many roles in mouse development including the gut, brain, sperm and her current major focus—lung morphogenesis. Her work on how a lung forms and repairs itself after injury has clinical implications on the origins of lung fibrosis and certain forms of inherited lung disease.

As a high school student, Hogan expressed an interest science, but found the classes "rather boring". That changed when her all-girl high school—unable to find a female science teacher—recruited a young man just out of school—Mr. Jones.

"Suddenly now there was this fresh person just out of University teaching in a high school which is quite unusual really," Hogan said in an interview last Spring.Jones told them, 'The most important thing is DNA.' He immediately set aside the old curriculum and had them doing squash preps of dog testes and *Tradescantia*.

"It was incredibly invigorating," Hogan said.

Hogan carried this excitement with her to the University of Cambridge where she earned a Bachelor's in Natural Sciences in 1964 and a PhD in Biochemistry in 1968. The journey was not easy though as she encountered a significant amount of prejudice as a woman in science.

"I have to say, I'm amazed that I survived," she said. "Women were put down in a really extraordinary way….You had to have this passion to keep going."

In 1968, Hogan left Cambridge for the Massachusetts Institute of Technology to do a postdoc with Paul Gross where she studied protein synthesis in sea urchin embryos. While happy to be doing developmental biology, she felt limited by the model. At the time, you couldn't do genetics in sea urchins, thus she was unable to address detailed questions about mechanism.

In 1970, Hogan returned to the UK and became an independent investigator at the University of Sussex. Over the next few years she worked primarily in cell culture. But, when she moved to the Imperial Cancer Research Fund at Mill Hill in 1974, she shifted to the mouse system, doing substantial work on teratocarcinoma cells and early mouse development.

"Once I began to work on mouse embryos, Anne McLaren was a major, major mentor in my life," Hogan said, both scientifically and personally. "[I] have been really lucky in working in mammalian development where there has been such a strong cohort of women. It's quite remarkable if you think about it." She acknowledged the tremendous support she received from the likes of Janet Rossant, Liz Robertson, Gail Martin, and Alex Joyner as they generously shared techniques, cell lines, and knowledge.

In the early 1980s, Hogan was instrumental in bringing the Cold Spring Harbor Mouse Course into existence. She wanted to create a space for scientists to learn new techniques and disseminate standard protocols. The consensus from her colleagues though was it would be a logistical nightmare trying to get mice to mate and generate enough embryos for the course, not to mention the equipment and financial support required to run it.

Hogan took advantage of a chance encounter at a Cold Spring Harbor Laboratory meeting with the institution's director, James Watson. She made her case for a mouse course, which provided the perfect nudge as Watson had been trying to get mouse developmental biologists Frank Costantini and Elizabeth Lacy to Cold Spring Harbor. In 1983, Hogan, Costantini, and Lacy ran the first Cold Spring Harbor Mouse Course (held annually now for the past 34 years). In 1986, they along with Rosa Beddington published the first

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edition of *Manipulating the Mouse Embryo: A Laboratory Manual*.

Hogan moved her lab to the National Institute for Medical Research in 1985 where her graduate student, Peter Holland, was among the first to clone mouse homeobox genes and use *in situ* hybridization to observe their expression pattern in mouse embryos.

Her work on the role of BMPs in mouse development took off after her move to Vanderbilt University in 1988. This led her down a path to study the development of many different organ systems including the kidney, lung, and heart.

"I hope it's not a Jack of all trades and master of none," she said. The reality though is the underlying mechanisms of how different cell types interact and undergo changes to form a functioning organ are often conserved. "What you learn in one system can be applied to the other," she said.

In 2002, Hogan was recruited to Duke University Medical Center to become Chair of the Department of Cell Biology. To date she has published some 250 scientific articles and reviews.

When reflecting on her role as a mentor Hogan stressed the importance of teaching people how to communicate their science —that is present a poster, write a manuscript and give a talk.

"It doesn't matter how brilliant you are with your hands or [the] ideas you have," she said. "If you can't persuade someone to fund you to do it, you're not going to be successful."

Hogan served as president of both the Society for Developmental Biology (2000–2001) and the American Society for Cell Biology (2008–2009). She is a member of the National Academy of Sciences and a Fellow of the Royal Society and the American Academy of Arts and Sciences.

Hogan expressed her appreciation at being awarded the Lifetime Achievement Award particularly from the Society for Developmental Biology. "It's a wonderful organization in every way," she said. "I was incredibly flattered and honored."

Marsha E. Lucas
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